The aluminum industry uses a four-digit index system for the designation of its wrought aluminum alloys. As outlined below, the first digit indicates the alloy group according to the major alloying elements.

1XXX SERIES
In this group, minimum aluminum content is 99%, and there is no major alloying element. The second digit indicates modifications in impurity limits. If the second digit is zero, there is no special control on individual impurities. Digits 1 through 9, which are assigned consecutively as needed, indicate special control of one or more individual impurities.

The last two digits indicate specific minimum aluminum content. Although the absolute minimum aluminum content in this group is 99%, the minimum for certain grades is higher than 99%, and the last two digits represent the hundredths of a per cent over 99.

Thus, 1030 would indicate 99.30% minimum aluminum. Without special control on individual impurities. The designations 1130, 1230, 1330, etc. indicate the same purity with special control on one or more impurities. Likewise, 1100 indicates minimum aluminum content of 99.00% with individual impurity control.

2XXX THROUGH 9XXX SERIES
The major alloying elements are indicated by the first digit, as follows:

- 2xxx: Copper
- 3xxx: Manganese
- 4xxx: Silicon
- 5xxx: Magnesium
- 6xxx: Magnesium and silicon
- 7xxx: Zinc
- 8xxx: Other element
- 9xxx: Unused series

The second digit indicates alloy modification. If the second digit is zero, it indicates the original alloy: digits 1 through 9, which are assigned consecutively, indicate alloy modifications. The last two digits have no special significance, serving only to identify the different alloys in the group.

EXPERIMENTAL ALLOYS
Experimental alloys are designated according to the four digit system, but they are prefixed by the letter X. The prefix is dropped when the alloy becomes standard. During development, and before they are designated as experimental, new alloys are identified by serial numbers assigned by their originators. Use of the serial number is discontinued when the X number is assigned.

ALUMINUM TEMPER DESIGNATIONS
Temper designations of wrought aluminum alloys consist of suffixes to the numeric alloy designations. For example, in 3003-H14, 3003 denotes the alloy and “H14” denotes the temper, or degree of hardness. The temper designation also reveals the method by which the hardness was obtained. Temper designations differ between non heat-treatable alloys and heat-treatable alloys, and their meanings are given below:

NON HEAT-TREATABLE ALLOYS
The letter “H” is always followed by 2 or 3 digits. The first digit indicates the particular method used to obtain the temper, as follows:
- H means strain hardened only.
- H2 means strain hardened, then partially annealed.
- H3 means strain hardened, then stabilized.

The temper is indicated by the second digit as follows:
- 2: 1/4 hard
- 4: 1/2 hard
- 6: 3/4 hard
- 8: full hard
- 9: extra hard

Added digits indicate modification of standard practice.

HEAT-TREATABLE ALLOYS
The letter “T” is always followed by one or more digits. These digits indicate the method used to produce the stable tempers, as follows:

- T3: Solution heat treated, then cold worked.
- T351: Solution heat treated, stress relieved, then cold worked.
- T36: Solution heat treated, then cold worked (controlled).
- T4: Solution heat treated, then naturally aged.
- T451: Solution heat treated, then stress relieved, then naturally aged.
- T5: Artificially aged only.
- T6: Solution heat treated, then artificially aged.
- T61: Solution heat treated (boiling water quench), then artificially aged.
- T651: Solution heat treated, stress relieved, then artificially aged.
- T652: Solution heat treated, stress relieved by compression, then artificially aged.
- T7: Solution heat treated, then stabilized.
- T8: Solution heat treated, cold worked, then artificially aged.
- T81: Solution heat treated, cold worked (controlled), then artificially aged.
- T851: Solution heat treated, cold worked, stress relieved, then artificially aged.
- T9: Solution heat treated, artificially aged, then cold worked.
- T10: Artificially aged, then cold worked.

Added digits indicate modification of standard practice.

COMPARISON OF MODERN & OLD SYSTEMS OF ALUMINUM ALLOY DESIGNATION

Although the old system of aluminum identification has been obsolete for many years, stock with the old markings is still occasionally found. The following comparison is presented as an aid in identifying such materials in terms of the modern system.

In the old system, alloy composition was indicated by a one- or two-digit number followed by the letter “S” to indicate that it was a wrought alloy, i.e., an alloy that could be shaped by rolling, drawing or forging. Any variation in the basic composition was indicated by a letter preceding the numerical alloy designation. For example, A17S was a modification of the basic alloy 17S. In modern terminology, these two alloys are designated 2117S and 2017S, respectively. Temper was designated by a second letter: “C” for soft (annealed), “O” for soft (annealed), “H” for strain hardness of non heat-treatable alloys, and “T” for hardness of heat-treatable alloys. Degree of hardness of non heat-treatable alloys was indicated by a fraction preceding the letter “H”. For example, 351/4H would be quarter-hard 3S alloy.

The following Table gives examples of the old and modern designations of some common aluminum alloys.